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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CLARK, GREGORY D	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,923	BUREAU ET AL.	
	Examiner	Art Unit	
	GREGORY CLARK	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/13/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,17-20 and 22* is/are pending in the application.

4a) Of the above claim(s) *9-16 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,17-20 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/12/2005, 11/13/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Examiner acknowledges the receipt of the Applicant's Amendment, received 11/13/2008. Claims 1-7, 17-20 and 22 pending; 1 amended, 2-5 original, 6-7 and 17-20 previously presented, 22 new.

Rejections and objections made in the previous office action that do not appear below have been overcome by applicant's amendments and therefore the arguments pertaining to these rejections/objections will not be addressed.

Election/Restrictions

Applicant's election of Group I in the reply filed on 11/13/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 17-20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bertrand (WO 2002/098926) in view of Guiseppi-Elie (5,766,934).

Regarding Claim 1, Bertrand teaches electro-grafting a strong adherent polymer coating on an electrically conductive surface comprising an electrochemical grafting at the surface of an active monomer (comprising a reactive functional group for attachment of a molecule having at least one complementary reactive group) (Page 5, lines 8-11). Bertrand does not teach electrografting resulting in 90% of the total functional groups being accessible.

The examiner notes the that the applicant indicates in the specification that the accessible groups of interest of the coating used will be sufficient in number to adapt as well as possible to the steric constraints, and more generally to the topology, of the object that it is desired to attach to this coating.

Although Bertrand doest specifically mention 90% accessibility of functional groups, an electrografting process carried out by someone of ordinary skill in the art would properly adjust the level of the "functional group containing species" to account for the expected steric constraints (crowding of the functional groups limit reactivity) to produce the desired percentage of functional group accessibility.

It has been held that discovering an optimum value (accessibility of functional groups) of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Bertrand further teaches electrografted coatings of polymers such as polyhydroxyethylacrylate can be deposited on the conducting substrates with a strong adhesion and an increased and tunable thickness (controllable thickness) (page 9, lines 18-20). Bertand fails to teach a density of 10^4/micron^2 to 10^{10}/micron^2 for accessible functional groups.

Guiseppi-Elie teaches electropolymerization providing a unique and convenient method for precise control of polymer film thickness by control of the electropolymerization charge density (column 2, lines 46-55).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine Bertrand with Guiseppi-Elie because Guiseppi-Elie provides a method for precise control of polymer film thickness which leads to convenient surface functionalization by subsequent blending with other molecules such as polypeptides. (Column 2, lines 57-61).

Moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the density for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2nd 272,205 USPQ 215 (CCPA 1980).

Regard Claim 2, Bertrand teaches the use of monomers with a reactive functional group toward nucleophilic compounds. The reactive functional group may be for example a succinimidyl group particularly reactive towards amines or epoxy, a vinyl, an allyl, an aryl, a chloride group or a combination of them (page 13, lines 1-3). When the reactive functional group is part of a preformed polymer, the monomer becomes a macromonomer bearing at least one activated vinylic pendant group (acrylic or methacrylic function) which allows formation of new primer by one-step electrografting of a reactive polymer called macromonomer (page 5, line 28-32).

Regarding Claim 3, Bertrand teaches grafted activated vinyl monomers can undergo controlled or uncontrolled ring opening polymerization (referred to by the applicant as molecules that are cleavable by nucleophilic attack) (page 8, lines 23-31).

Regarding Claim 4, Bertrand teaches electro-reactive species in the form or acrylates and methacrylates containing an anchoring group (labeled as the X group in diagram page 5) that can be electrografted to conductive surfaces (page 5, lines 7-31). Betrand mentions glycidyl methacrylate as one of the monomers used in electrografting (page 9, line 9).

Regarding Claim 5, Bertrand teaches the use of lactones and lactides such as (e-caprolactone), and functional caprolactones such as g-bromo- e-caprolactone, or lactide such as D, L-Lactide or any other polymerizable cyclic monomer such as cyclic anhydride (page 9, lines 1-4). The examiner notes that these materials are cleavable by nucleophilic attack.

Regarding Claim 6, Bertrand teaches grafting a molecule or macromolecule with a complementary functional group to the surface via polycondensation or polyaddition which include: proteins, enzymes, oligonucleotides, drugs, dyes, or small organic molecules of particular interest like electroactive molecules (aminoferrocene), vitamin (biotine), and ligands (page 13, lines 10-18).

Regarding Claim 7, Bertrand teaches electrografting reactions on steel, stainless steel, Inox316L, tantalum, titanium, nitinol carbon, ITO glass, transition metal (Fe, Ni, Cu, Au, and Ag), metal doped polymers (page 6, lines 30-32).

Regarding Claims 17-20, Betrand teaches electrografied acrylates or methacrylates containing an anchoring group for attachment of a molecule having at least one complementary reactive group (page 5, lines 20-26). The process allows the grafting onto the initial coating (adhesion primer) by compounds like functional polymers such as, protein, peptide, oligonucleotide (defined as DNA chips, page 4, line 28), dyes, drugs, and anti-bacterian compounds (page 6, lines 9-11).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bertrand (WO 2002/098926) and Guiseppi-Elie (5,766,934) as applied to claim 1 above, and further in view of Masunaga (3,759,797).

Regarding Claim 21, Masunaga teaches electrografting monomers to a solid support via electrolytic polymerization which includes monomers with and without reactive functional groups (column 2, lines 17-22). Some of these monomers include metacrylonitrile (nitrile functional group), ethyl acrylate (no functional group), 2-hydroxyehtylmethacrylate (hydroxyl functional group), styrene (no functional group), and glycidylacrylate (epoxy functional group) (column 2, lines 17-25).

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teaching of Bertrand/Guiseppi-Elie and Masunaga before him or her to modify the functional monomers of Bertrand/Guiseppi-Elie to include the non-functional monomers of Masunaga because Bertrand/Guiseppi-Elie uses monomers for electrografting and the non-functional monomers by Masunaga could be easily incorporated.

The suggestion/motivation for doing so would have been that a mixture of functional and non-functional monomers subjected to electrografting would allow for better separation between the functional species which would in turn decreases the level of steric crowding leading to improved accessibility for subsequent nucleophilic attack.

Response to Arguments

1. Applicant's arguments with respect to claim 1-24 have been considered but are moot in view of the new ground(s) of rejection necessitated by the applicants amendment.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

GDC